

SPECIFICATION

RAIL ASSEMBLY FOR ATTACHING SERVER TO CABINET

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

[0001] The present invention relates to a rail assembly, and particularly to a rail assembly which can conveniently attach a server to a cabinet.

2. Related Art

[0002] A conventional rail assembly for mounting a server to a cabinet has a plurality of ball bearings or pulleys provided therein. This kind of rail assembly is shown in Taiwan Patent Application No. 089220370. The rail assembly comprises a rear bracket, a front bracket, a rail and a plurality of pulleys. The front bracket comprises a first connecting portion, and the rear bracket comprises a second connecting portion engaging with the first connecting portion. A length of a connection of the first connecting portion and the second connecting portion can be adjusted for fitting to various cabinets. Two blocking members are formed in opposite ends of the front bracket respectively, for limiting movement of the pulleys within the front bracket.

[0003] In this rail assembly, when the server needs to be maintained, the server cannot be fully drawn out of the cabinet because the pulleys are restricted in the front bracket by the blocking members. This makes maintenance or replacement of the server inconvenient. In addition, the pulleys render the structure of the rail assembly unduly complicated and wide. Consequently, the cost of the rail assembly is high, and the rail assembly occupies excessive space in the cabinet.

[0004] Thus, a rail assembly which overcomes above-mentioned problems is desired.

SUMMARY OF THE INVENTION

[0005] Accordingly, an object of the present invention is to provide a retaining assembly for a rack cabinet which is relatively inexpensive and can be conveniently assembled and used.

[0006] To achieve the above-mentioned object, a rail assembly in accordance with the present invention comprises a rail bracket adapted to be mounted in a sidewalls of the cabinet, an outer rails movably received in the rail bracket, and an inner rails attached to a sides of a server tray and movably received in the outer rail. The rail bracket comprises a first part and a second part adjustably connected with the first part. The outer rail has a blocking member formed therein. Each of the inner rails has an acting member formed therein engaging with the blocking member of the outer rails. So the outer rail can be moved outward together with the inner rail for fully drawing the server out of the cabinet without the outer rail detaching from the rail bracket, when a server retained in the server tray needs to be maintained.

[0007] Other objects, advantages and novel features of the present invention will be drawn from the following detailed description of a preferred embodiment of the present invention with the attached drawings, in which:

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Fig. 1 is an exploded, isometric view of a rail assembly in accordance with the preferred embodiment of the present invention;

[0009] Fig. 2 is an enlarged view of a circled portion II of Fig. 1;

[0010] Fig. 3 is an enlarged view of a circled portion III of Fig. 1;

[0011] Fig. 4 is an assembled view of the rail assembly of Fig. 1;

[0012] Fig. 5 is an enlarged, front elevation view of the rail assembly of Fig. 4;

[0013] Fig. 6 is an exploded, isometric view of a pair of the rail assemblies of Fig. 1, together with a server tray;

[0014] Fig. 7 is an assembled view of Fig. 6;

[0015] Fig. 8 is similar to Fig. 7, but showing the server tray in a withdrawn position relative to the rail assemblies; and

[0016] Fig. 9 is an exploded, isometric view of a rail assembly in accordance with an alternative embodiment of the present invention.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] Referring to Figs. 1 to 6, a rail assembly in accordance with the preferred embodiment of the present invention comprises an inner rail 20, an outer rail 30 and a rail bracket 80. A pair of the rail assemblies is used for mounting a server tray 60 into a cabinet (not shown).

[0018] The inner rail 20 comprises a first base plate 22. Two guiding flanges 24 are formed on opposite longitudinal sides of the base plate 22 respectively. A resilient protrusion 242 is formed in an end of one of the guiding flanges 24. Three spaced fixing openings 224 are defined in the first base plate 22. Each fixing opening 224 comprises a hole (not labeled), and a slot (not labeled) in communication with the hole. A width of the slot is less than a diameter of the hole. An inserting hole 222 is defined in an end of the first base plate 22 that corresponds to the protrusion 242.

[0019] The outer rail 30 comprises a second base plate 32. Two guiding hems 34 are formed along opposite longitudinal sides of the second base plate 32 respectively. Each guiding hem 34 is folded inwardly to form a first railing 36 parallel to and offset from the guiding hem 34. Two first sliding spaces 38 are defined between the two respective first railings 36 and the second base plate 32.

A blocking slot 322 is defined in the second base plate 32, corresponding to the protrusion 242 of the inner rail 20.

[0020] The rail bracket 80 comprises a first part 40 and a second part 50. The first part 40 comprises a third base plate 42. Two second railings 46 are formed on opposite longitudinal sides of and parallel to the third base plate 42. Two second sliding spaces 48 are defined between the two respective second railings 46 and the third base plate 42. A first mounting portion 44 is formed at an end of the third base plate 42. Three first mounting holes 442 are defined in the first mounting portion 44. A hook 422 is formed in an opposite end of the third base plate 42. An elongated slot 424 is defined in the third base plate 422 adjacent the hook 422.

[0021] The second part 50 comprises a fourth base plate 52. A pair of through holes 522 is defined in the fourth base plate 52, corresponding the elongated slot 424. A second mounting portion 54 is formed at an end of the fourth base plate 52. Three second mounting holes 542 are defined in the second mounting portion 54.

[0022] Two fixing holes (not shown) are defined in opposite sides of the server tray 60 respectively. A plurality of mushroom posts 64 projects from each of the opposite sides of the server tray 60, the mushroom posts 64 corresponding to the fixing openings 224 of the inner rails 20.

[0023] Referring also to Fig 7, in assembly, the second mounting portion 54 of the second part 50 of each rail bracket 80 is firstly mounted in a rear portion of the cabinet by fixing means (not shown) engaging in the second mounting holes 542. The end of the first part 40 of the rail bracket 80 having the hook 422 is received in the second part 50. A plurality of screws (not labeled) is sequentially inserted through the elongated slot 424 and the through holes 522 for engaging with a plurality of corresponding screw caps (not labeled). Thus a portion of the first

part 40 is slidably received in and engaged with the second part 50. A length of the portion of the first part 40 received in the second part 50 can be adjusted by adjusting the positions of the screws in the elongated slot 424. The first mounting portion 44 of the first part 40 is mounted in a front portion of the cabinet by fixing means (not shown) engaging in the first mounting holes 442. In this way, two rail brackets 80 are mounted in the cabinet.

[0024] The inner rail 20 of each rail bracket 80 is positioned against a corresponding side of the server tray 60, with the corresponding mushroom posts 64 of the server tray 60 extending through the holes of the respective fixing openings 224 of the inner rail 20. The inner rail 20 is then slid until necks of the mushroom posts 64 are received in the slots of the fixing openings 224. A fastener (not shown) is inserted through the inserting hole 222 of the inner rail 20 and engaged in a corresponding fixing hole (not shown) of the server tray 60. The inner rail 20 is thus fixed to the server tray 60.

[0025] The guiding flanges 24 of the inner rail 20 are slid into the first sliding spaces 38 of the outer rail 30 until the protrusion 242 of the inner rail is engaged in the blocking slot 322. In this way, a pre-assembly comprising two inner rails 20, two outer rails 30 and the server tray 60 is obtained. The pre-assembly is then inserted into the cabinet by sliding the guiding hems 34 of the outer rails 30 along the second sliding spaces 48 of the first parts 40.

[0026] Referring to Fig. 8, in use, when a server retained in the server tray 60 needs to be maintained or replaced, the server may be removed as follows. The server tray 60 is pulled outward. The inner rails 20 are consequently pulled outward. Friction between the outer rails 30 and the first parts 40 is slightly greater than friction between the outer rails 30 and inner rails 20. Therefore, the outer rails 30 do not move until the protrusions 242 of the inner rails 20 have moved to corresponding ends of the blocking slots 322. Then the outer rails 30 are moved together with the inner rails 20, by reason of the protrusions 242

pushing the outer rails 30 at said ends of the blocking slots 322. The server tray 60 is thus fully withdrawn from the cabinet without the outer rails 30 detaching from the first parts 40, whereupon the server can be conveniently maintained or replaced.

[0027] When the server tray 60 needs to be inserted back into the cabinet, the inner rails 20 are moved inward together with the server tray 60. The outer rails 30 are moved inward by fixing ears (not labeled) attached at front ends of the opposite sides of the server tray 60. The server tray 60 is thus conveniently received in the cabinet.

[0028] Referring to Fig. 9, a rail assembly 10' in accordance with an alternative embodiment of the present invention comprises an inner rail 20', an outer rail 30' and a rail bracket 80. The rail assembly 10' is similar to the rail assembly 10 of the preferred embodiment. The difference is that in the rail assembly 10', the blocking slot 322 of the outer rail 30 is substituted by a blocking plate 322' of the outer rail 30', and the protrusion 242 of the inner rail 20 is substituted by a tab 242' provided on a first base plate 22' of the inner rail 20'. Assembly of the rail assembly 10' is substantially the same as that of the rail assembly 10. In use of a pair of the rail assemblies 10', the outer rails 30' are pulled out together with the inner rails 20', by reason of the tabs 242' engaging with the blocking plates 322'.

[0029] From the foregoing it will be appreciated that the present invention provides a rail assembly for attaching a server tray to a cabinet, whereby the server tray can be fully drawn out of the cabinet. This allows convenient maintenance or replacement of a server retained in the server tray. In addition, the rail assembly has a relatively simple structure, thereby reducing the cost of the producing the rail assembly. Furthermore, space occupied by the rail assembly is also reduced.

[0030] It is understood that the invention may be embodied in other forms without departing from the spirit thereof. Thus, the present examples and

embodiments are to be considered in all respects as illustrative and not restrictive, and the invention is not to be limited to the details given herein.